T1-A User Manual V1.2

2016.07.20 Revision

For Firmware Version V4.10 or above

& Assistant Software Version V1.20 or above

Please strictly follow these steps to mount and use this product, as well as to install the Assistant Software on your computer or phone.

Thank you for purchasing TopXGun product. There are web pages of T1 at our website www.topxgun.com, which is updated regularly. You can obtain product information, technical updates and manual corrections. TopXGun recommends you to download and use the newest user manual. The information contained in this manual is subject to change without notice.

This manual is only for basic assembly and configuration; you can obtain more details and advanced instructions when using the assistant software, if you find the information on software and user manual are not consistent, the assistant software shall prevail.

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Introduction

Disclaimer & Warning

Please read this disclaimer carefully before using the product. By using this product, you hereby agree to this disclaimer and signify that you have read them fully.

THIS PRODUCT IS NOT SUITABLE FOR PEOPLE UNDER THE AGE OF 18.

This product is an autopilot system designed for serious multi-rotor aircraft. It can provider user with fabulous flight experience when the system is powered normally and the connection is correct. When setting parameters or updating firmware, we strongly recommend users to remove all propellers, and make sure all connections are good. Keep the aircraft away from people, dangerous objects and fragile objects. TopXGun accepts no liability for damage or injuries incurred directly or indirectly from the use of this product in the following conditions:

1. Failure to follow the guidance of the manual to assemble or operate.

2. Damage or injuries incurred when users are drunk, taking drugs, fatigue and any other conditions no matter physically or mentally that could impair your ability.

3. Damage or injuries caused by subjective intentional operations.

4. Malfunctions caused by refit or replacement with non-TopXGun accessories and parts.

5. Damage or injuries caused by mis-operation or subjective mis-judgment.

6. Damage or injuries caused by mechanical failures due to erosion, aging.

7. Damage or injuries caused by knowingly flying the aircraft in abnormal condition.

8. Damage or injuries caused by using in bad weather, such as typhoon, hail, fog etc.

9. Damage or injuries cause by flying in the following situations such as the aircraft in magnetic interference area, radio interference area, government regulated no-fly zones.

10. Damage or injuries caused by operating aircraft in condition of low visibility or blocked eyesight.

11. Damage or injuries caused by infringement such as any data, audio or video material recorded by the use of aircraft.

12. Other losses that are not covered by the scope of TopXGun liability.

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Certifications

This product is approved with quality standards such as FCC, CE and RoHS.

Introduction

Product Introduction

TopXGun T1-A is a professional flight controller combining main functions of agricultural UAV in current market, it can be installed on a variety of model structures, it has the functions as follows:

- Intelligent mode
- Dose detection
- Resume spray function
- Precision spraying
- Support 10 types of multi-rotor platform
- Low Voltage Protection
- Fail safe and Go Home
- Protection for motor failure or broken airscrew blade (apply to hex-rotors drone or above)

In The Box

Warranty card×1, Main controller×1, PMU×1, GPS/Compass×1, LIU×1, DCU×1, GPS Bracket×1, Servo Cable×8, Micro-USB×1, AV cable×1, 3M Adhesive Tape.

Symbol Description

Universal Symbol

Symbol	Significance	Description
⚠️	Attention	This mark represents potential risk, if ignore it, may result in equipment damage, loss of data or other unpredictable consequences.
💡	Intruction	Starting with this mark is the additional information of the body and the emphasis and supplement on the body.

LED Symbol

Symbol	Description
🟠 (N)	It means yellow LED indicator flashes N times ;
{ 🟠 🟣 } (N)	It means yellow and purple LED indicator flash N times ;
🟠 (∞)	It means yellow LED indicator continuously flashes ;
🟠 (N)	It means yellow LED indicator is continuously on for N seconds.

1 Assembly & Configuration

1.1 Hardware Installment

Step1. Confirm multi-rotor type, forward direction and rotation direction of the motor/propeller.
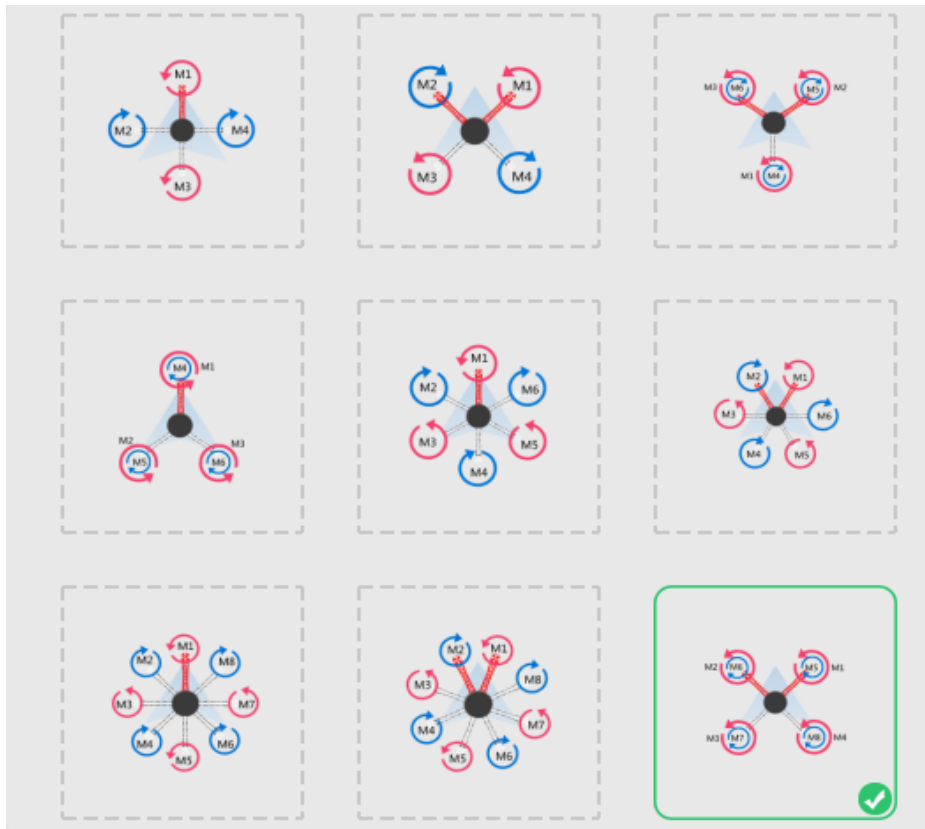

Figure 1-1 Confirm multi-rotor type

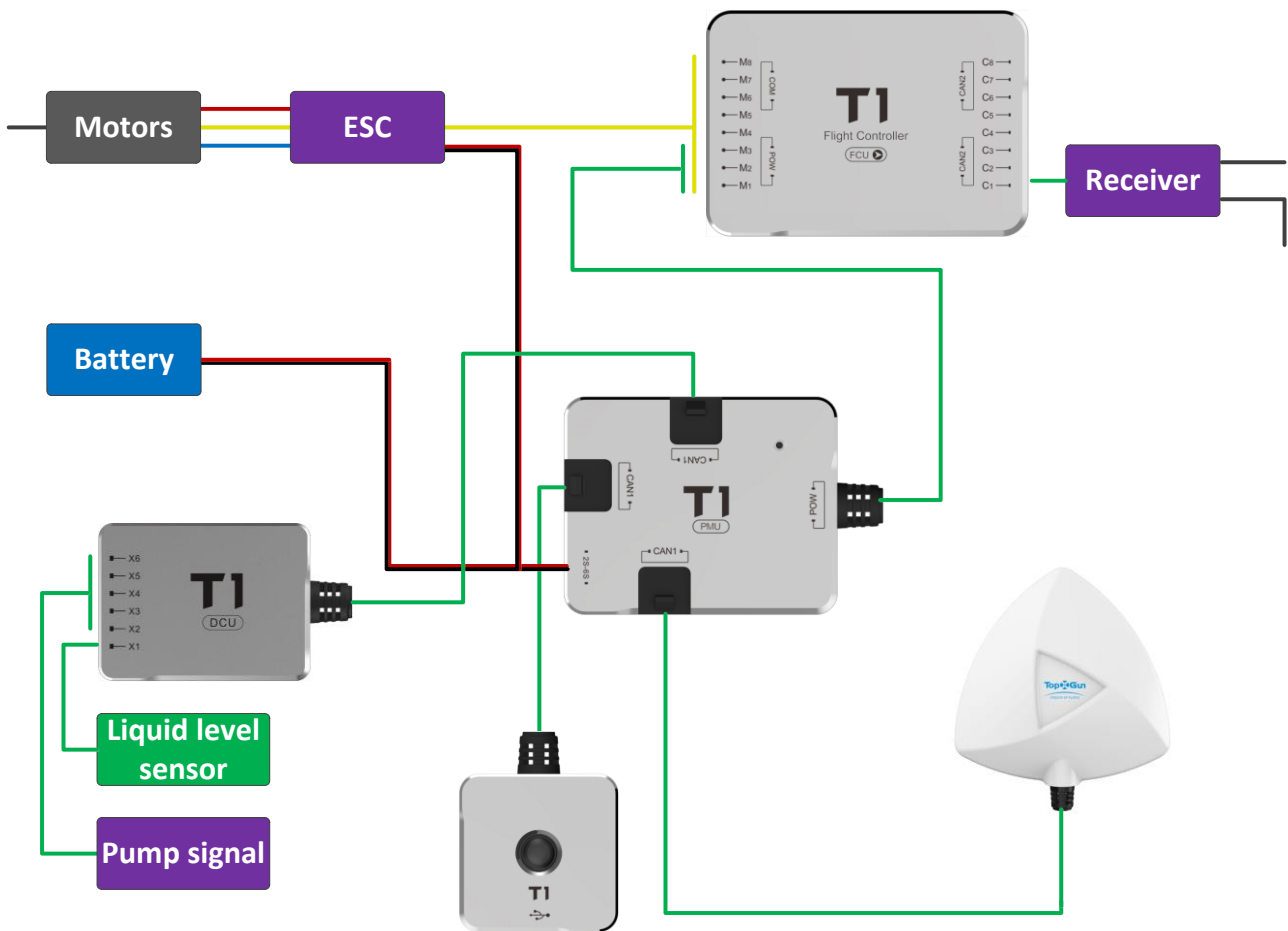**Step2.** Install the controller unit, connect every part.

Figure 1-2 Hardware connection diagram

Installation Specification

● **Main controller module installation**

Installation position requirements

The TopXGun logo should be facing the sky, with the orientation arrow pointing directly to the nose direction, please mount it on a central place in board center of aircraft.

Port connection

➢ Connection of ESC: Connect M1 ~ M8 to ESC, T1-A supports up to eight motors at most (ESC signal wire is down and earth wire is up)

⚠ If use ESC which owns the function of BEC output, the red power output line in the middle of the BEC should be cut off.

➢ Connection of receiver: SBus and PPM receiver can be connected directly to C1. PWM receiver should be connected to C1 ~ C8 on flight controller. The receiver should have at least six channels for realizing built-in advanced functions of flight controller. (Recommended to use servo cable of flight controller includes to connect flight controller and the receiver.)

➢ If you have matched DTU (data transmission unit), please connect it to COM port on MC, it is recommended that you complete fixation after wiring.

● **PMU module installation**

Please do not mount it on any other electronic device, choose a ventilated place for cooling. Make sure the three CAN ports are convenient for connecting during installation.

> 💡 Three ports of PMU module have same defination

- **GPS/COMPASS module installation**

When installing the top side should be facing up, with the orientation arrow pointing directly to the nose direction, mount it on the bracket horizontally. Connect it to any one of the CAN ports of PMU. It is recommended to use bracket included in package, otherwise, please make sure it is nonmagnetic.

> ⚠️ The module built-in magnetic compass as magnetic sensitive equipment,please pay attention to keep it away from the motor, ESC, power battery and etc when install and use.

- **LIU module installation**

Mount in a good place to make sure the LIU is visible during flying, don't cover the USB port, connect it to any one of the CAN ports of PMU with the enclosed 3M adhesive tape.

- **DCU module installation**

Installation position requirements

Choose the appropriate position on aricraft board and connect it to any one of the CAN ports of PMU.

Port connection

X1 port is connected to liquid level sensor, X2~X6 port is connected to pump output, the instruction as below:

> ⚠️ When access to ESC of water pump, if use ESC which owns the function of BEC output, the red power output line in the middle of the BEC should be cut off.
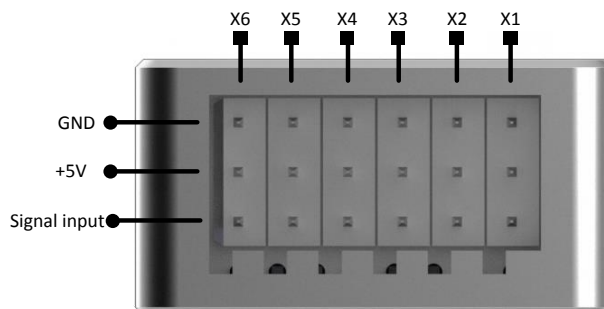

Figure 1-3 DCU Installation Instruction

1.2 Installation & Test

Preparation before installation and debugging

T1-A flight controller supports PC, Mobile phone to adjust prameters

- If you do the configuration on phone, you only have to install phone app and buy bluetooth module,no need to install any driver.

- If you do the configuration on PC, it must meet below demends:

- support windows system Windows XP/7/8/10
- PC has connectted to Internet.
- Install latest software uesd to adjust prameters (It may need to install drive program)

Install and test steps

Here follows the instruction of parameter setting steps, taking the adjustable parameter software settings asexample. You can see details of setting method according to the inner specification of adjustable parameter software.

Step1. Use USB cable to connect flight controller and PC.

PC will automatically detect flight control and connection.

⚠️ When using a USB to connect flight controller and PC, it must be given flight control power.

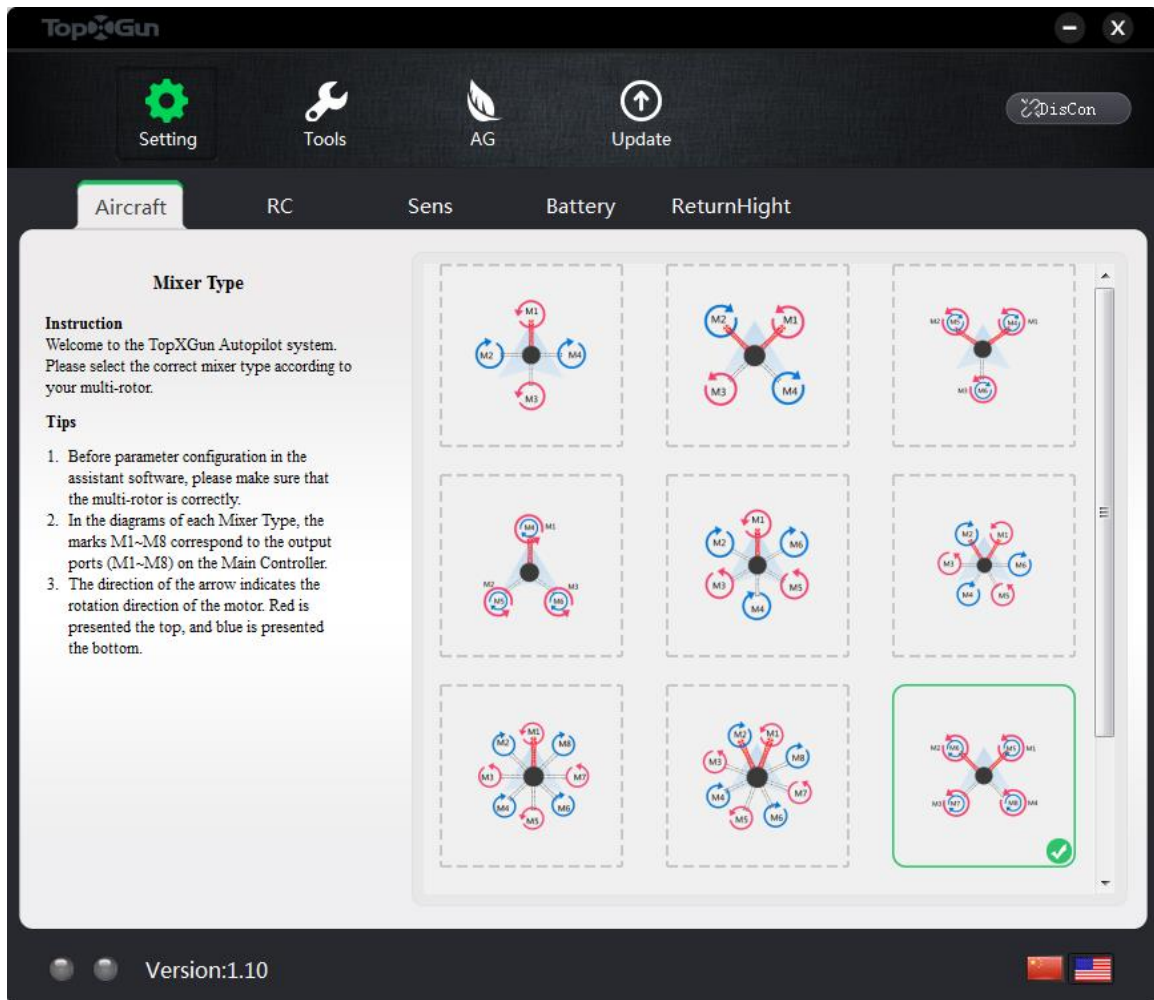**Step2.** Choose the type of aircraft.

Figure 1-4 choose the type of aircraft

💡 (1) The direction of the red arrow indicates rotating clockwise (view from the top).
(2) The direction of the blue arrow indicates rotating anticlockwise (view from the top).
(3) To coaxial propellers: red propeller is at Top; blue propeller is at Bottom.

Step3. Choose the type of receiver and calibrate it.

1. Choose the type of receiver that you have installed, reboot MC after selection.

2. Setup a new fixed wing model on transmitter, choose a three position switch for CH5, choose a two position or three position switch for CH6.

3. Click the"START CALIBRATION"button, and move all of the sticks throughout their complete range several times, then click the "FINISH CALIBRATION" button.

⚠️ Remote control only unlock after the correct calibration, please check the channel direction is correct or not:

- ■ turn the aileron stick to right, the roll cursor slides to right;
- ■ turn the rudder to right, the yaw cursor slides to right;
- ■ pull the elevator stick, the pitch cursor slides to right;
- ■ push the throttle stick, the throttle cursor slides to right;

4. Flip the CH5,CH6 stick,check if the position on software matches with the control mode.

💡 If the receiver type is not SBus, you need to do as follow:
1. Set the end point of CH5 to 30%～70%
2. Set the rudder angle in the range of normal mode.
you can verify the Fail-Safe setting by shutting down the transmitter, the control mode will automatically jump to red 'Fail-Safe' area.

Step4. Gain setting.

1. Choose the axle base of aircraft which you are using,for your better flying experience,some parameters have been set automatically according to the axle base of aircraft.

2. You can adjust flying gain in "Gain Adjustment".

3. You can setup the gain manually until you confirm the best flying gain.
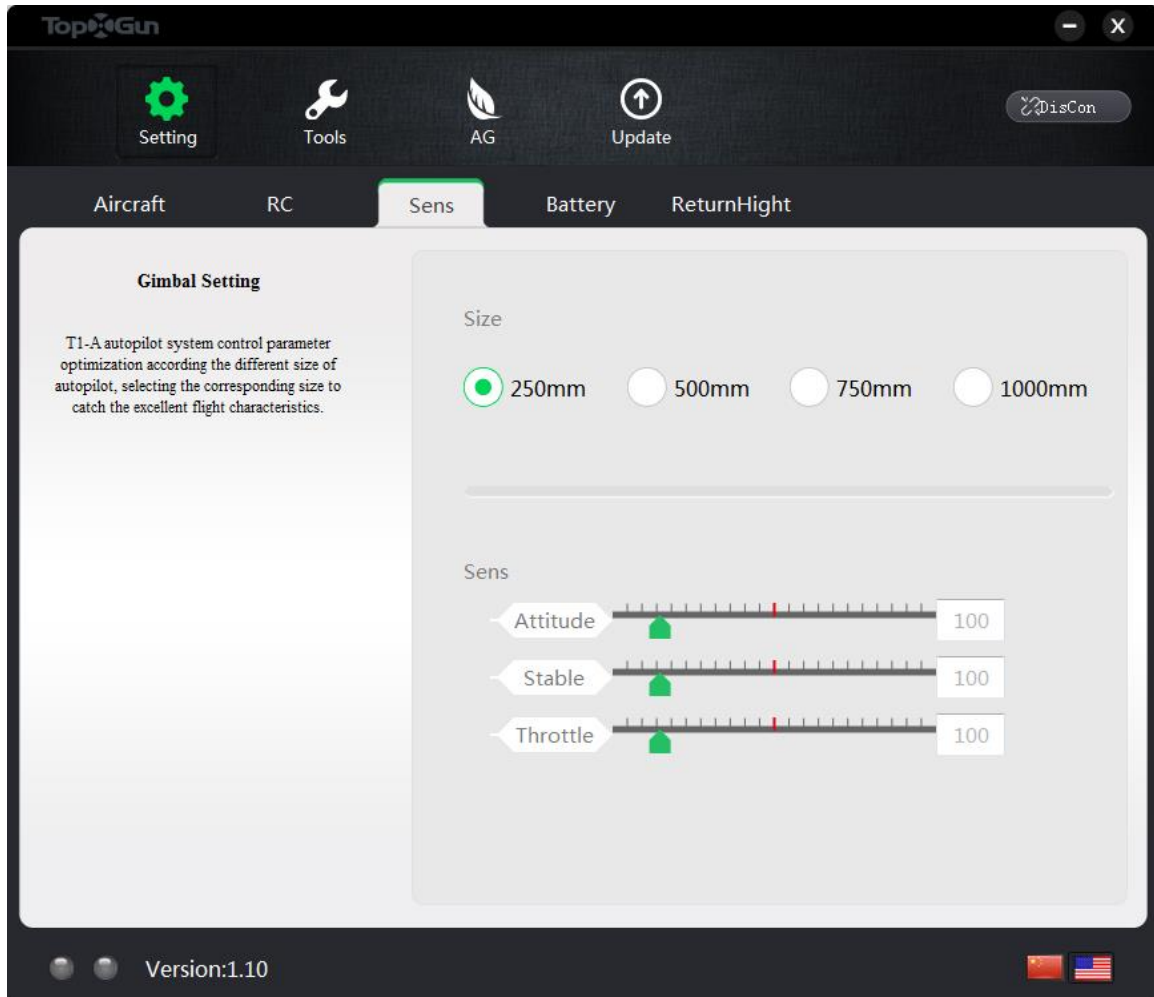
Figure 1-6 Gain setting

Step5. Low-voltage protection setting.

● If you do not want to use this function, you can turn it off, then the aircraft will only alarm with LED blinking when the battery is low.The first level protection has yellow LED blinking, the second level protection has red LED blinking.

● If the low-voltage protection is turned on, the aircraft will return automatically during first level protection, during second level protection the aircraft will land automatically.

No matter the auto-return or land in stand point, you can switch CH5 mode twice to terminate low-voltage protection at any time .

If the low-voltage protection is triggered, you are unable to switch to any kind of flight mode except for attitude mode and returning mode and landing mode.
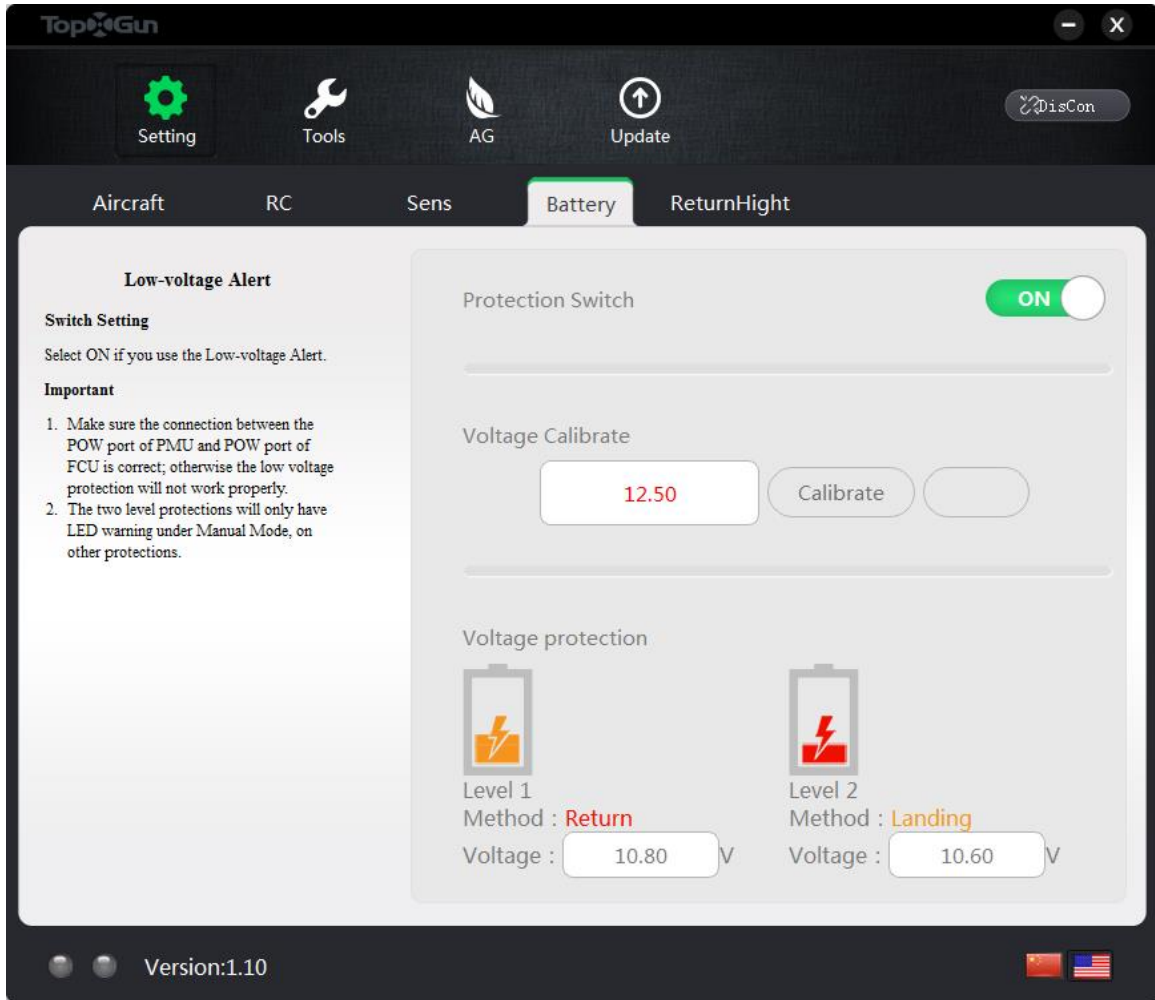
Figure 1-7 Low-voltage protection setting

Step6. Set the return height, as shown in figure 1-8.

In return, the aircraft cannot avoid obstacles. Therefore, it is need to set the appropriate return height , according to the actual needs of the environment.
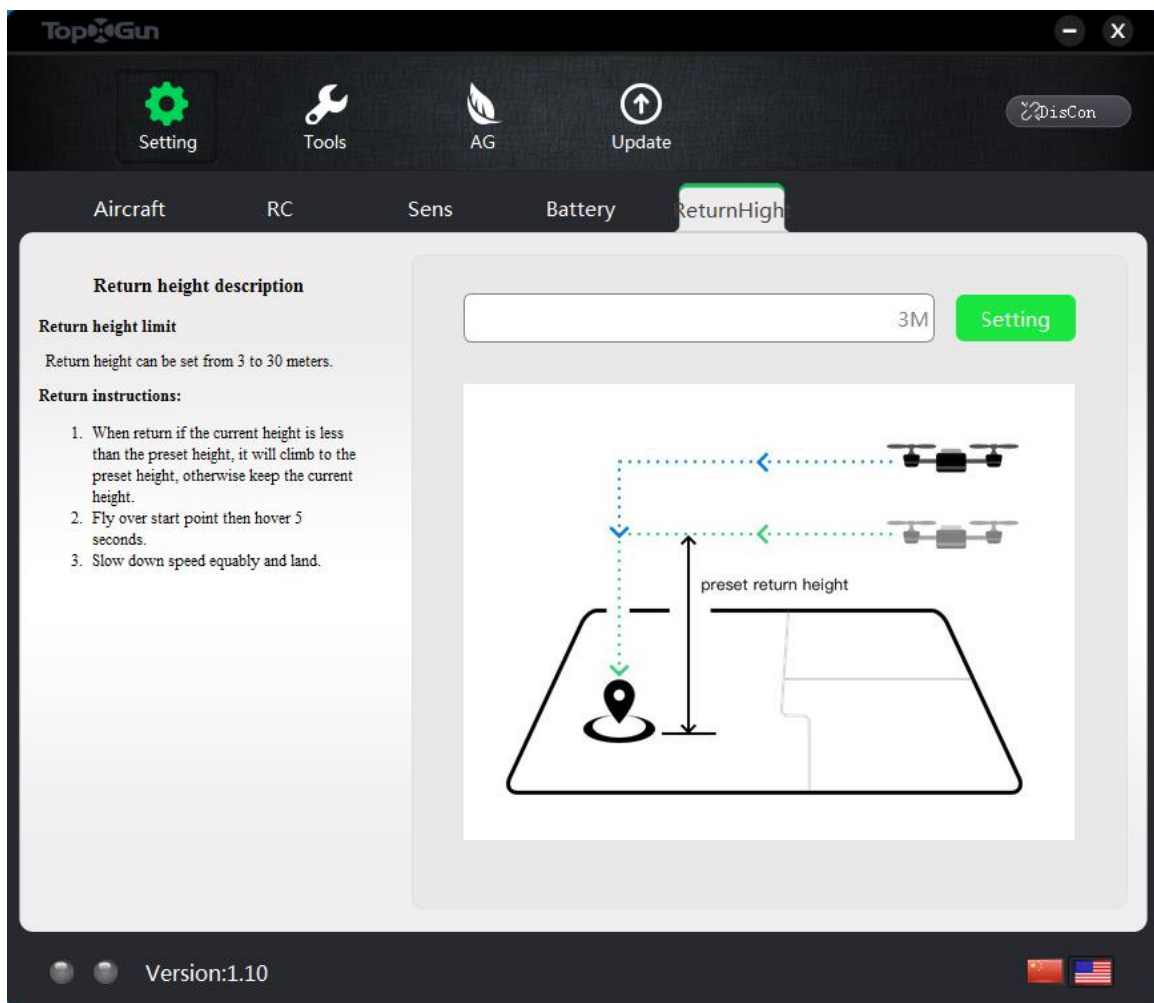
Figure 1-8 Return height setting

Step7. Set working parameters.

1. Click the "agricultural protection" button, enter the settings page.

2. Choose "spraying range" page, set the working spray range.
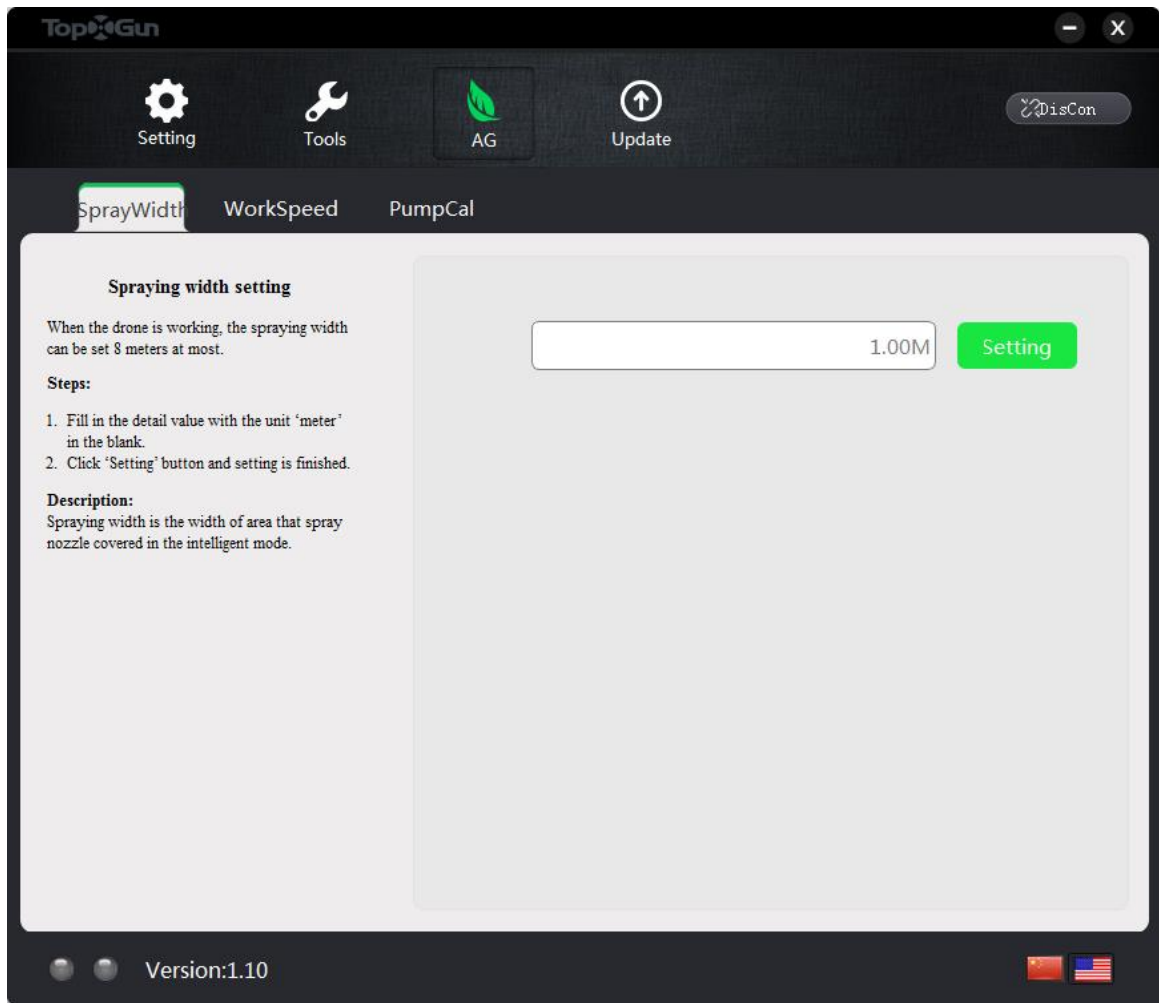
Figure 1-9 spraying range setting

3. Choose "working speed"page, set the maximum working speed.
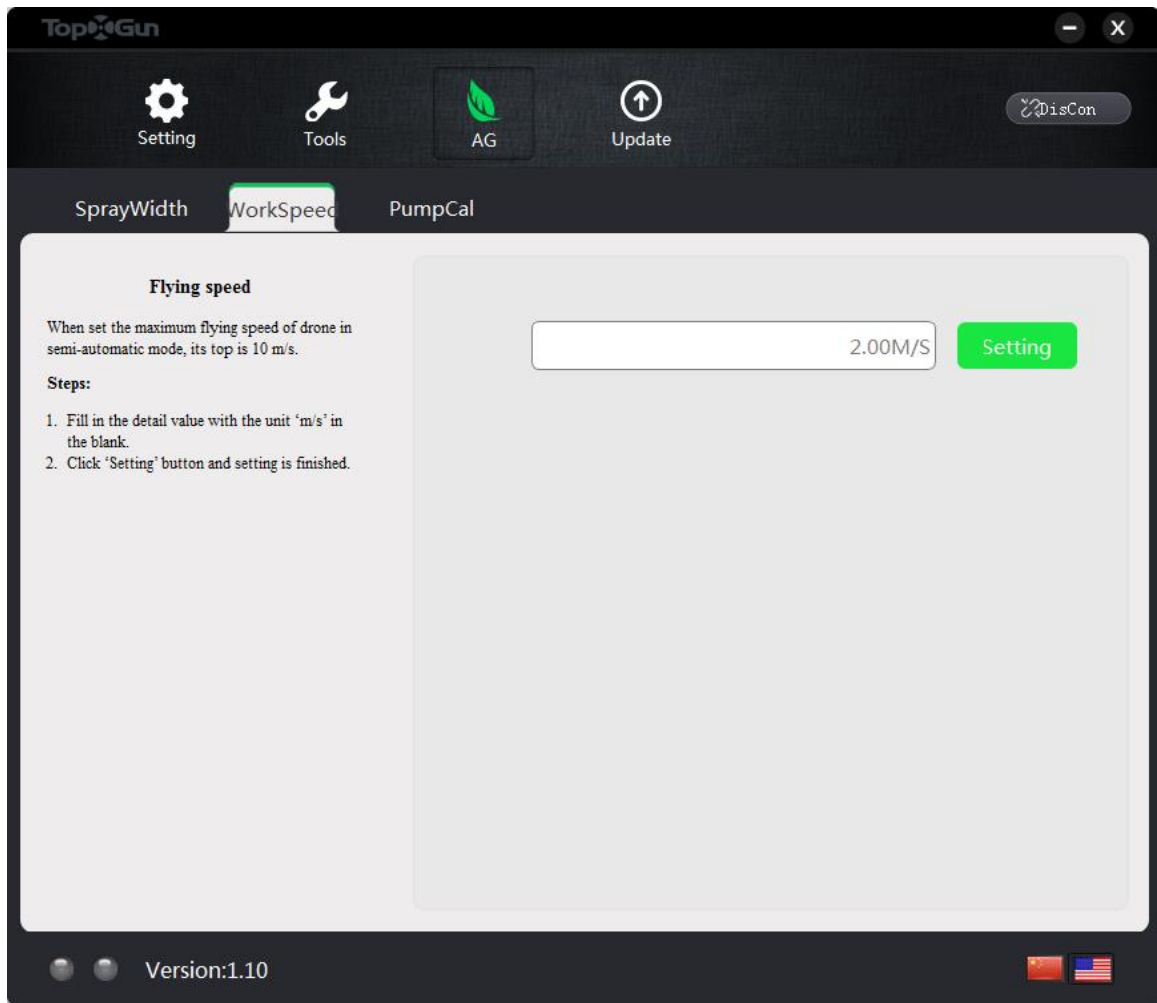
Figure 1-10 working speed setting

4. Choose "pump calibration" page, set up work spray speed and minimum spray speed respectively.
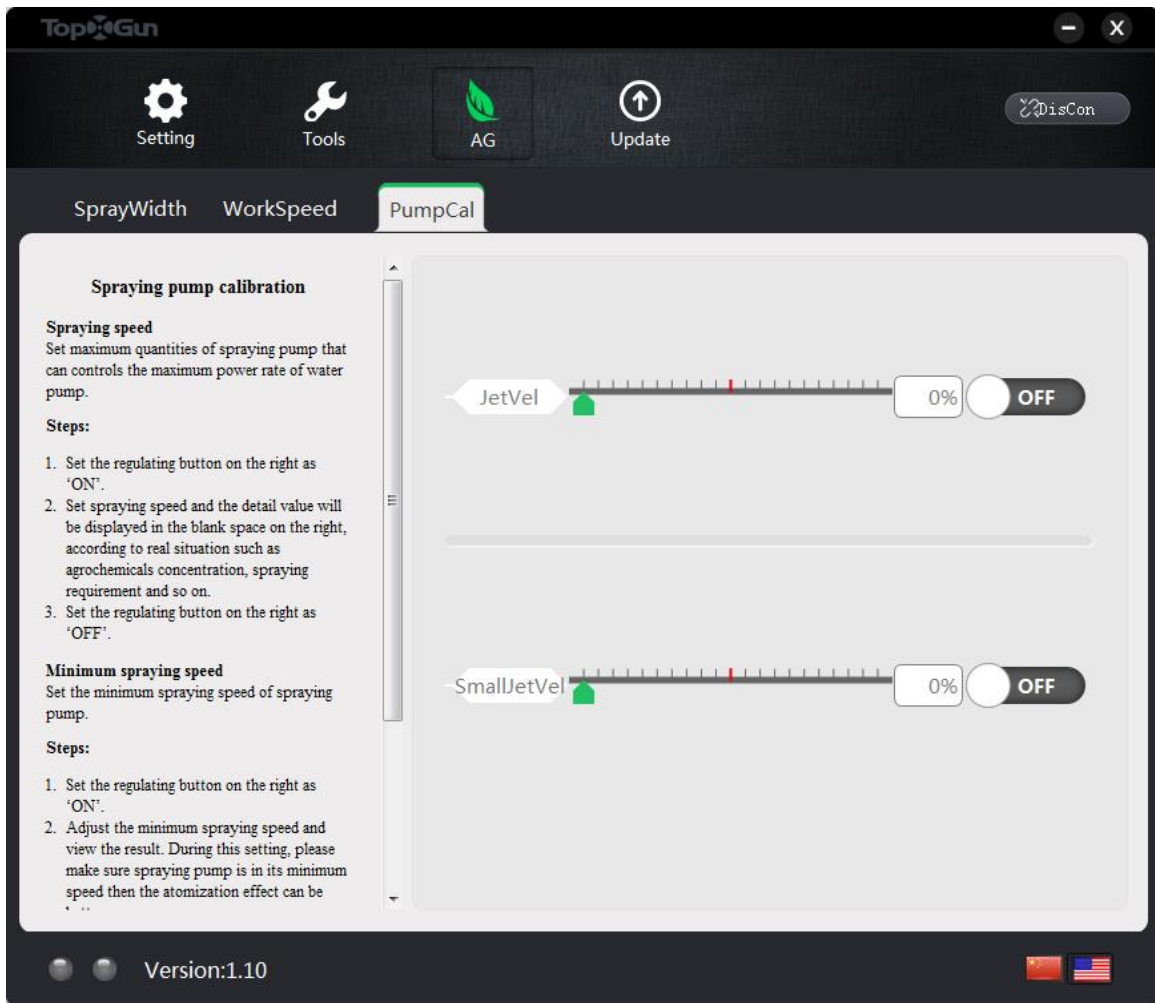
Figure 1-11 pump calibration setting

1.3 Unlock And Lock

T1-A has only one way to unlock the aircraft, follow the figure 1 to unlock no matter whether you are using Japan TX or US TX, and follow the figure 2 to lock the aircraft. The aircraft will automatically lock after landing with the throttle stick maintaining minimum for 3 seconds.

After ESC has calibrated by T1-A flight controller, the motor will turn on according to the order when you unlock the drone. When there is run-up of NO. 1 motor , all will turn on at the same time after you push the throttle .The idle speed of DJI series ESC is higher. There is no idle speed of moter when your use its recommended idle speed. It can be solved when you shift it to the higher idle speed in motor idle interface.

figure 1 unlock

figure 2 lock

1.4 ESC And Compass Calibration

ESC and compass can be calibrated by the switch combination of CH5 on the remote control.

⚠️ If you adopt the method of separate power supply for motor and flight controller, you need to cut the power for motor first, the power for flight controller later, when you want to do calibration and repower it. After this, power can be provided for flight controller at first, motor later.

ESC and compass can be calibrated by flipping stick, you may refer to below figures for calibrating.

Procedure of ESC clibration	LED status indication
Push the throttle stick to maximum postion	Current status of GPS and flight mode
Flip CH5 to minimum and maximum for 6~10 times quickly	Constant red
keep the throttle postion unchanged, reboot the MC	LED blinks red and green and blue by turn for one time
After the MC is repowerd, the motor will beep twice, pull the throttle stick to minimum position within two seconds	After the LED blinks red and blue alternatively, it turns to normal indication

Figure 1-12 Procedure of ESC calibration

Quickly flip the control mode switch

Position 1
Position 3
Position 1-3-1
Fli 6 ~ 1 Time
p 0 s

360°Rotate the aircraft horizontally
(Nose forward)

360°Rotate the aircraft vertically
(Nosedownward)

Constant blue
Start horizontal calibration

Constant green
Start vertical calibration

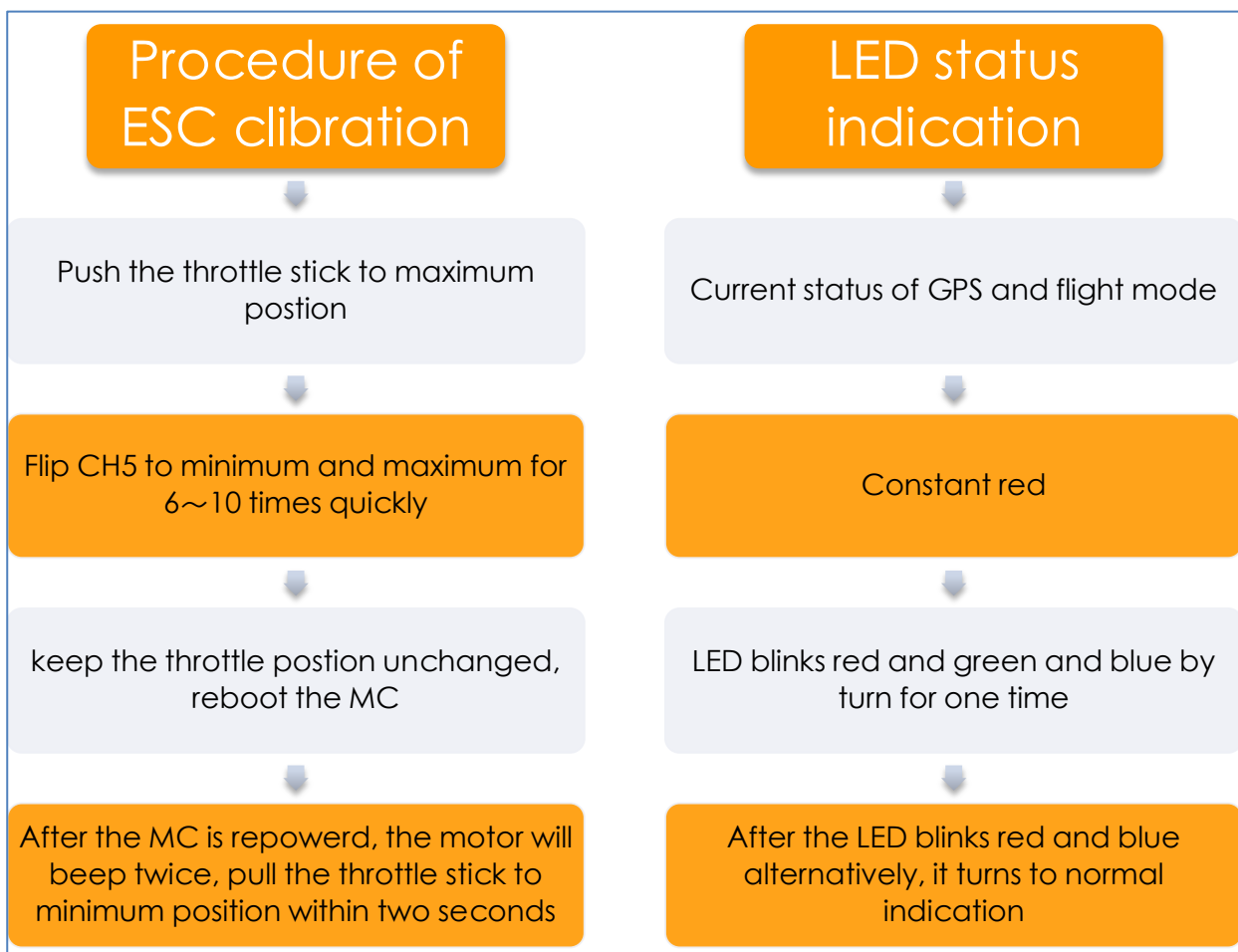White for 4s | Red for 4s
Succee | Fai

Position 1
Position 3
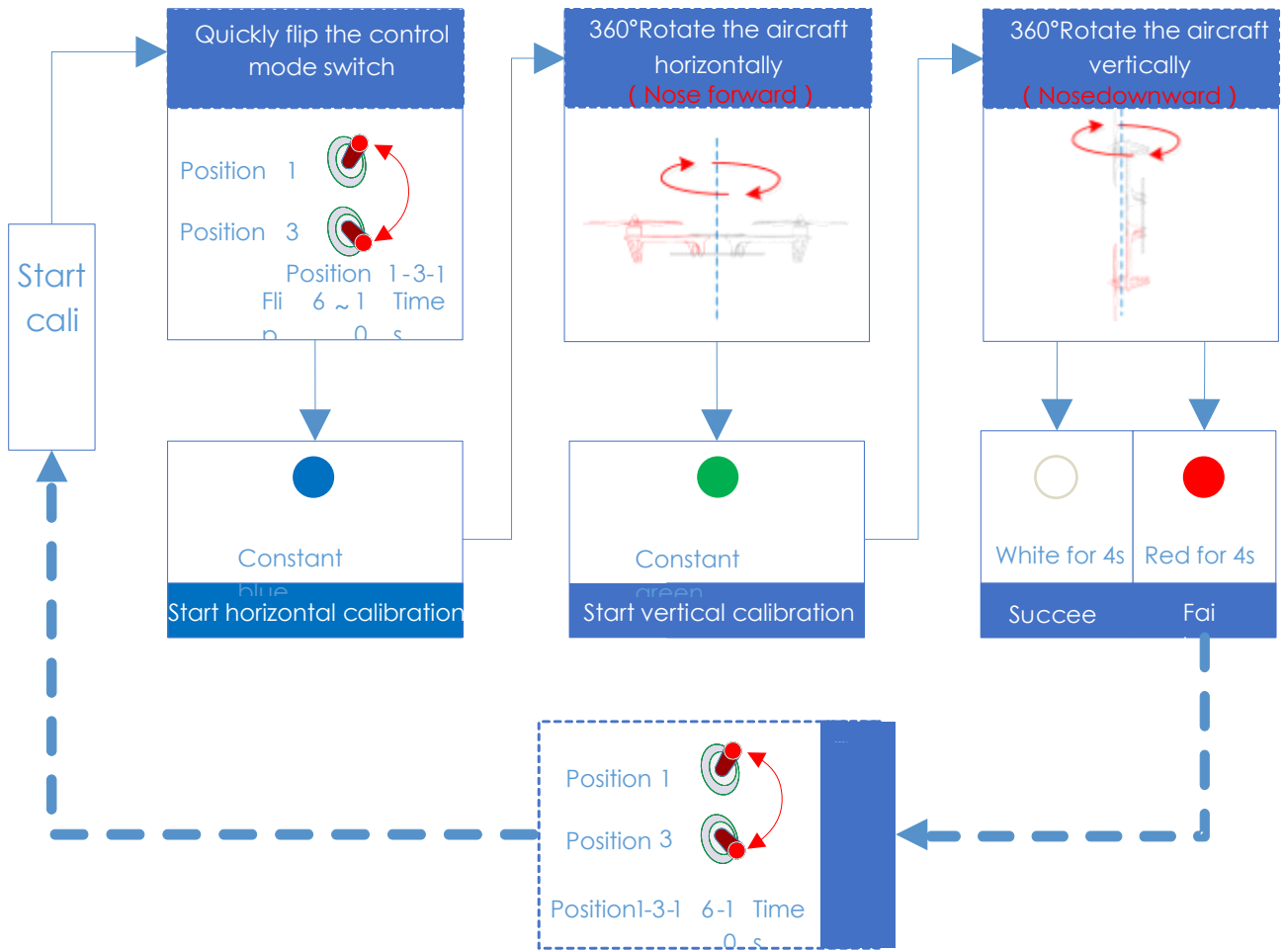Position1-3-l 6-1 Time
0 s

Start cali

Figure 1-13 T1-A Procedure of compass calibration

1.5 Horizontal Calibration

For the first time before a test flight, put the plane on level ground and make it perform toe-out locking action for 10 seconds. When the blue and green indicator of LIU is flashing alternately, you can loosen remote controllever.After about 10 seconds, there is only LIU blue indicators flashing, then 15 seconds later, LIU is normal, which shows that the calibration is successful. Calibration process takes about 25 seconds altogether. If the drone stillon one side during the flight in attitude mode, you are suggested to do horizontal calibration once again.

2 Fly Test

2.1 Flight Mode And Corresponding Responding

Channel CH5 can be three position switch. When set to three position switch, bottom-middle-top position correspond to attitude mode and operation mode and GPS mode. Attitude mode and GPS mode are used most generally. When need to work, should be set to operation mode. Different mode bar quantity and aircraft movements corresponding as shown in table 2.1.

Table 2.1 T1-A Control mode instruction

Control mode	Stick operation	Respond of aircraft	Remark
Attitude mode	Roll/Pitch	Tilt angle of roll and pitch is proportional to their stick range	
	Yaw	The yaw speed corresponds to yaw stick range	
	Throttle	The average output of motor corresponds to current throttle value, and throttle output has the maximum privilege	
GPS mode	Roll/Pitch	Tilt angle of roll and pitch is proportional to their stick range, but the speed of level flight is limited below maximum speed of level flight(10m/s)	
	Yaw	The yaw speed corresponds to yaw stick range	
	Throttle	Aircraft maintains the attitude when the throttle is in mid position, the up/down range of throttle correspond to up/down speed	
Operation mode	Roll/Pitch	Stir the controller of roll or pitch then return middle, aircraft will fly to the direction the controller moves.	
	Yaw	The yaw speed corresponds to yaw stick range	
	Throttle	Aircraft maintains the attitude when the throttle is in mid position, the up/down range of throttle correspond to up/down speed	

CH6 channel can be set in three switches. Modes of low, mid and high are respectively corresponding to modes of normal, standby and return. The aircraft can be set in return mode, when it is needed to return . In the attitude and GPS mode, when aircraft is set in standby mode, the spraying can be started.

2.2 LED Indicator Descriptions

Normal flight indication: Blinks status of GPS firstly, then blinks status of flight mode			
Indication	LED status	Instruction	Remark
GPS status	🔴 （1）（2）	GPS unavailable	🔴（2）Less than 7 satellites are available, 🔴（1）More than 7 satellites are available, but the quality is no good

	🟢	GPS available	
Flight mode	🟡	Attitude mode, with no roll input or pitch input	
	🟡 **(2)**	Attitude mode, with roll input or pitch input	
	🟣	GPS mode, with no roll input or pitch input	
	🟣 **(2)**	GPS mode, with roll input or pitch input	
	🟢	Automatic pilot mode	This LED blinks during automatic pilot mode or automatic return mode

Special status indication: these indication have higher priority than normal flight indication			
Indication	**LED status**	**Instruction**	**Remark**
Initialized state	{🔴🔵} **(10)**	Hardware initialized, compass has been corrected by "zeroing"	
Sensor state	⚪ **(∞)**	Abnormal data of IMU or barometer	Reboot the MC
	{🟡🟢} **(∞)**	Abnormal data of compass	Check if there is magnetic disturbance
Receiver state	{🟡🔵} **(∞)**	Receiver signal lost	
Voltage state	🟡 **(∞)**	First level low-voltage alert	
	🔴 **(∞)**	Second level low-voltage alert	
Home point record	🔵 **(10)**	Record home point	Record home point when the GPS is available for positioning for the first time; Record home point every time the motors start.
Waypoint state	🔴 **(5)**	Arrive at the destination	
Breakpoint prompt	🔵 (4)	Breakpoint memory	

Function state indication: indicate function operation state			
Indication	**LED status**	**Instruction**	**Remark**
Compass calibration	🔵	During process of Calibrating in the xy axis	
	🟢	During process of Calibrating in the z axis	
	⬜ **(4)**	Compass calibration successful	
	🔴	Compass calibration failed	
ESC calibration	🔴	The flag of ESC calibration has been stored, continue to complete calibration after reboot	

💡 (1) 🟠 (N) means LED blinks yellow N times；

(2) {🟠🟣} (N) means LED blinks yellow and purple alternatively N times；

(3) 🟠 （∞）means LED continuously blinks；

(4) 🟠 （N）means LED is continuously on for N seconds.

2.3 Firmware Update

⚠️ It is need to confirm that you have download the latest adjusting-parameter software and connected to the Internet before update the firmware.

Step1. Click "update" button, enter into the interface of firmware update,then choose the module you need to update.
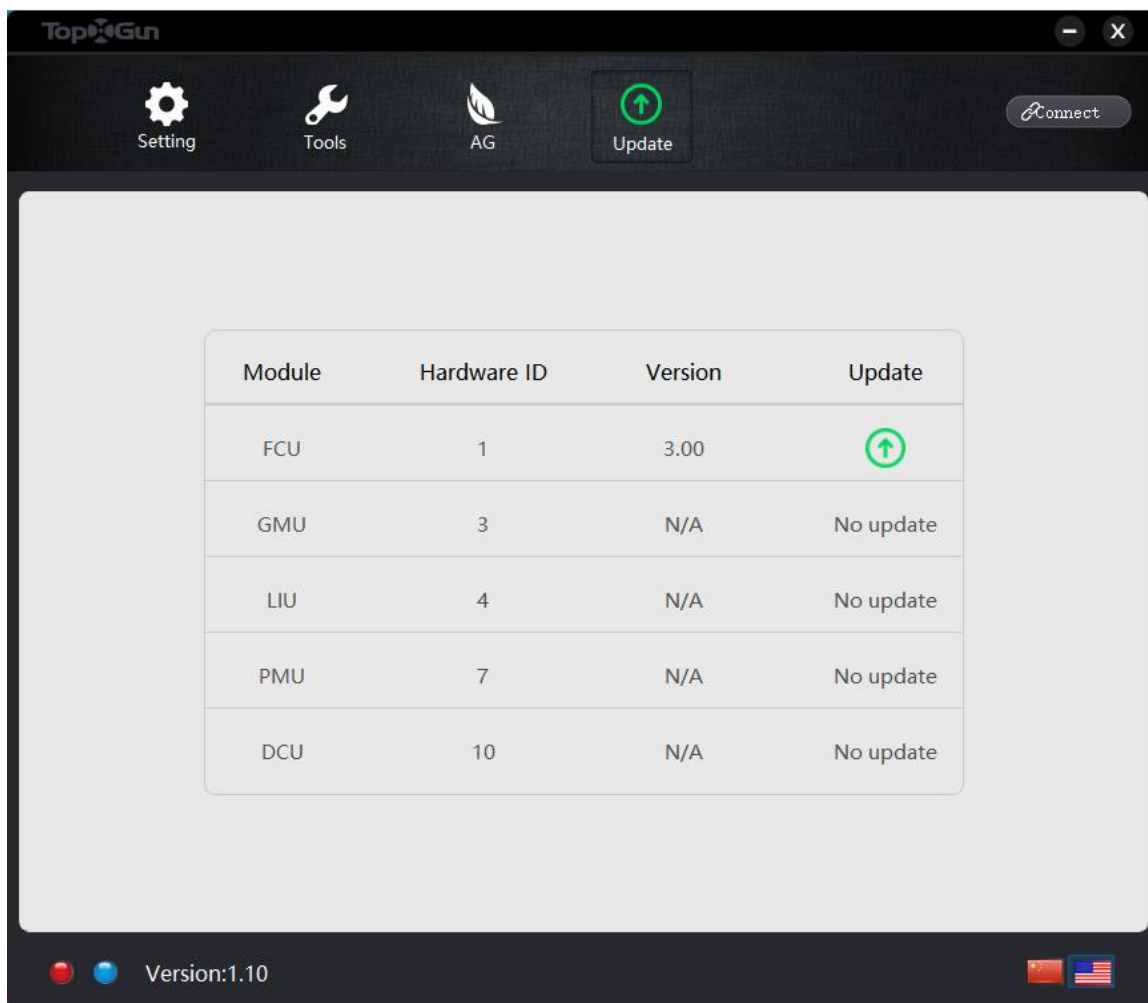

Figure 2-1 firmware update 1

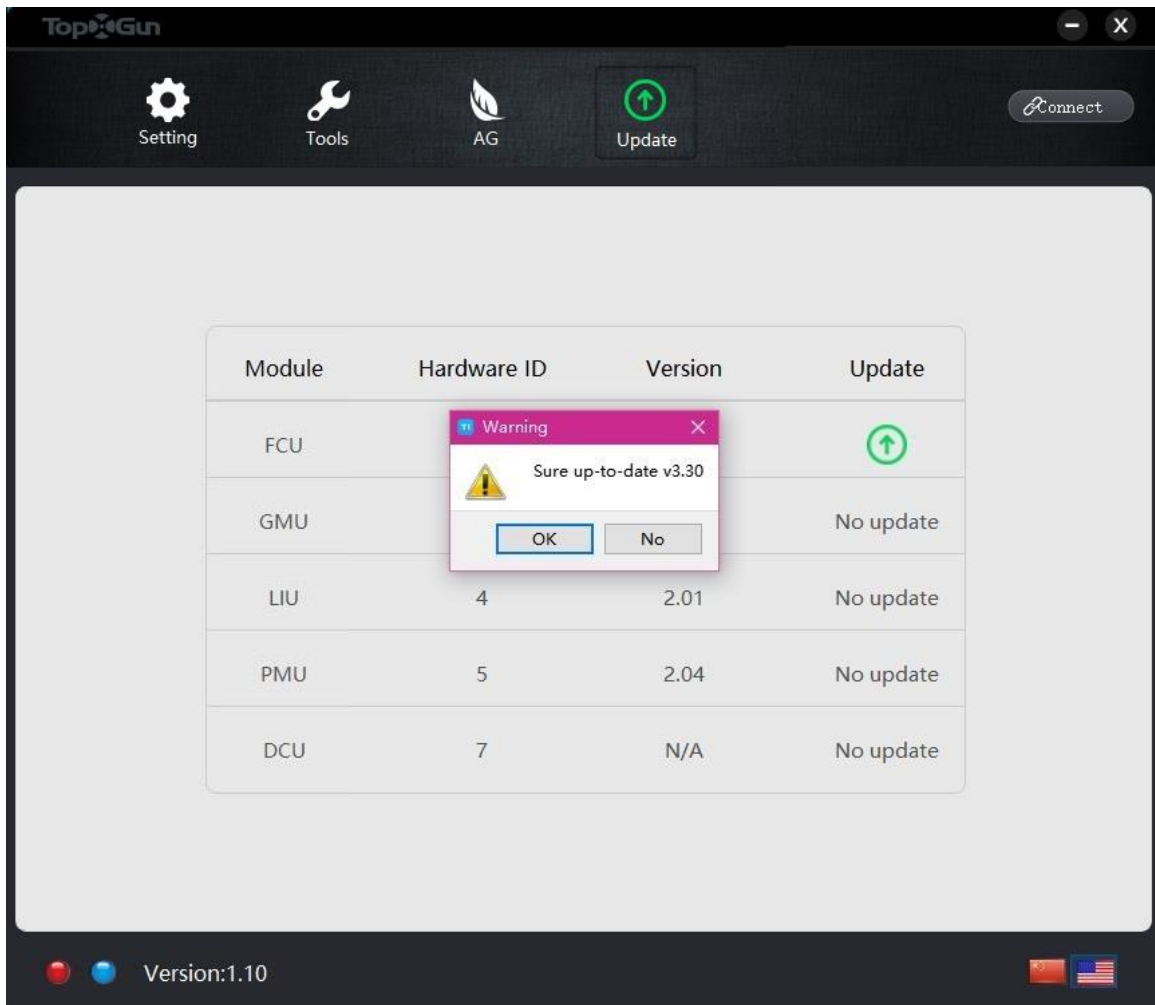**Step2.** Click this buttom " ⬆️ ", system will upgrade the firmware

Figure 2-2 firmware update 2

Step3. When the update of firmware is finished successfully, click 'Yes' button in the dialogue box to complete the whole update process.

After the upgrade, the display of 'No update is avaiable' in 'Upgrade' column means the current firmware is the latest version.

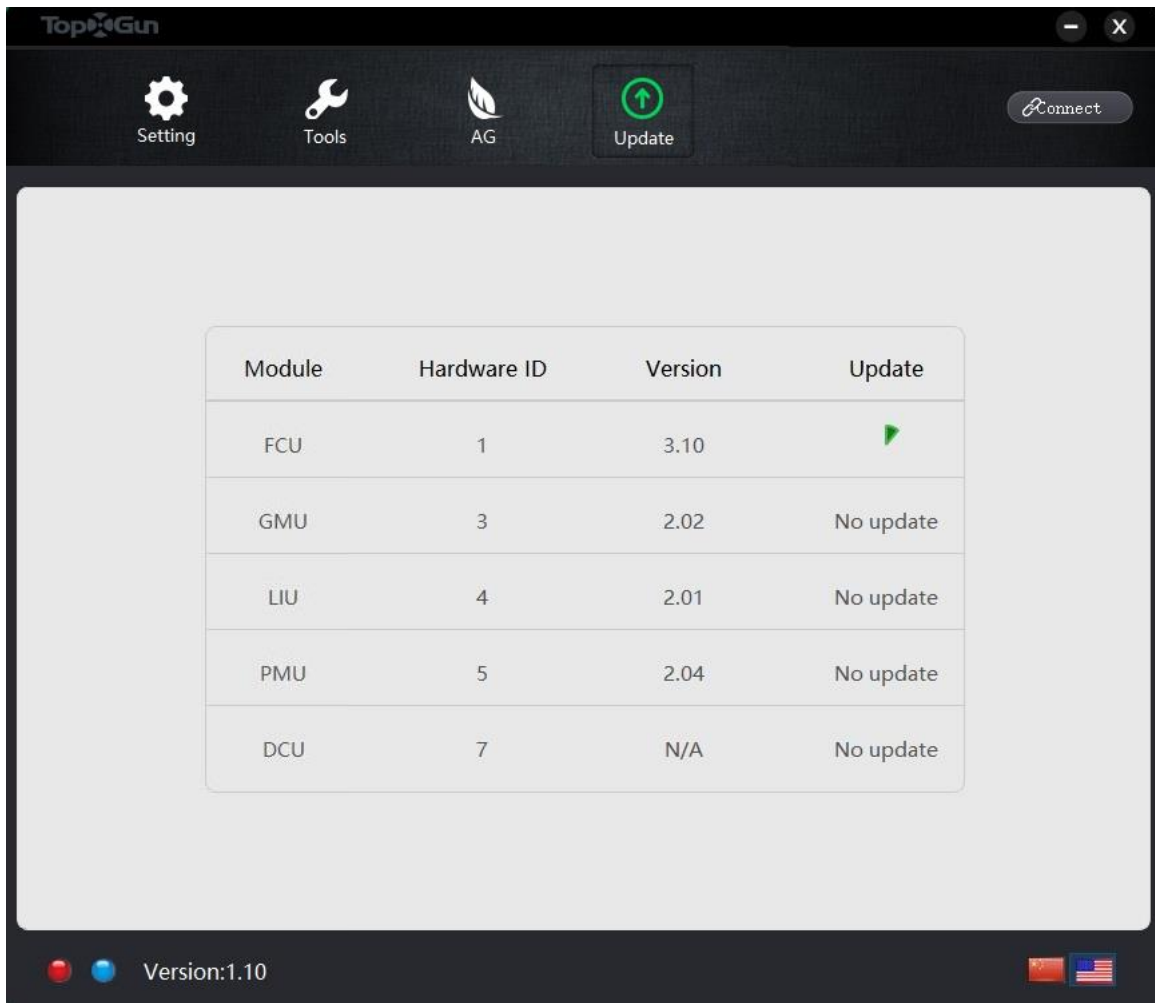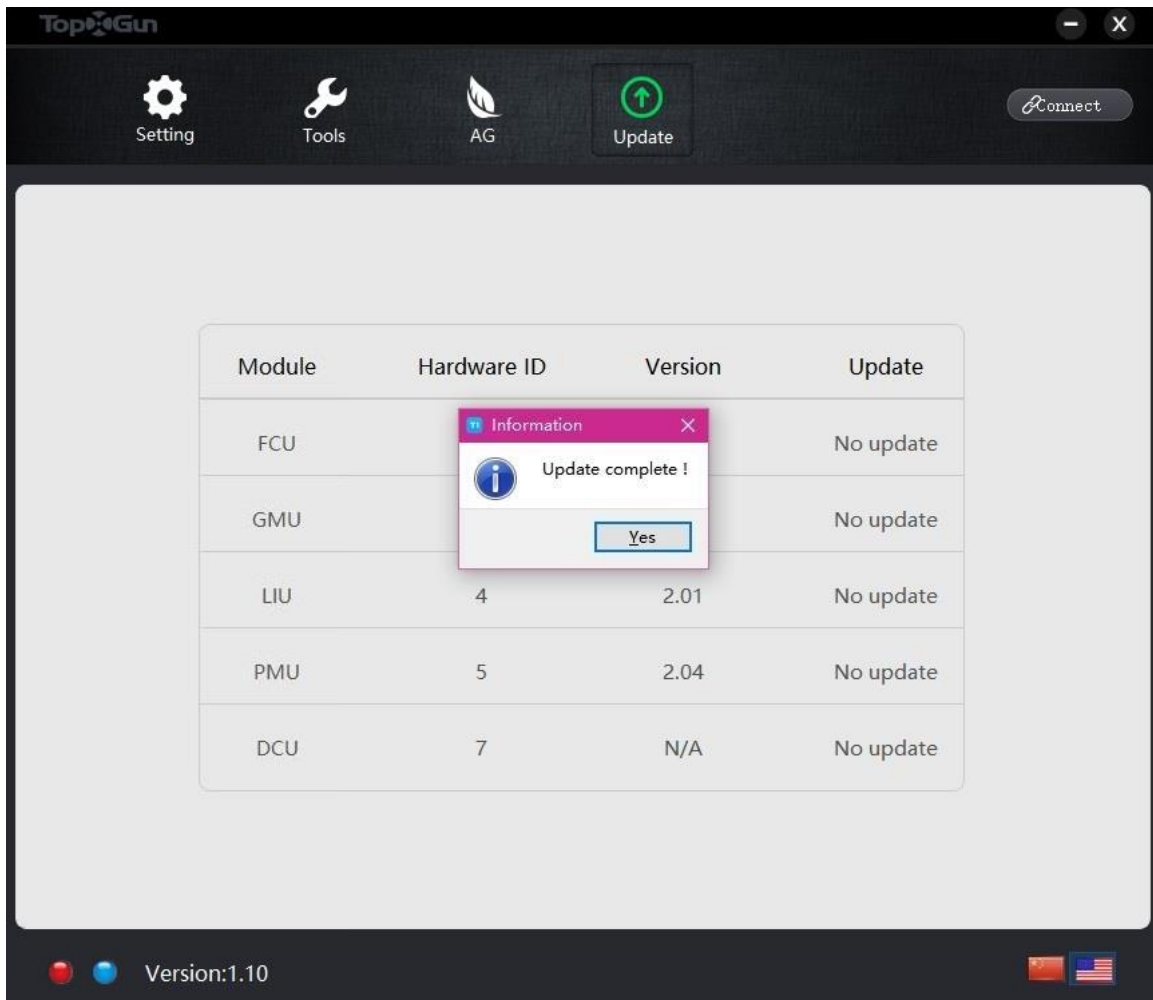| Module	Hardware ID	Version	Update
FCU	1	3.10	▶
GMU	3	2.02	No update
LIU	4	2.01	No update
PMU	5	2.04	No update
DCU	7	N/A	No update

Figure 2-3 firmware update 3

Figure 2-4 firmware update

⚠️ When updated FCU version 3.00 and its previous version to version 3.10,the version NO. will be indicate error on the first connection. After the update is successful, the firmware version 3.10 will be shown.When you reconnect after disconnect USB, firmware version number will display an error. Now you need to connect the computer to upgrade the firmware again. After the update is successful, the firmware version 3.10 will be shown again. After the reconnect the firmware version is displayed correctly.

2.4 First Test Flight

Double check the items by following steps before flight, ensure safe flight.

Step1. Check before flight

Double check the nose direction, MC installation direction, motor rotating direction, make sure the connection between every part is solid.

Step2. Power on and Check

(1) Please switch on the transmitter first, then power on multi-rotor

(2) After MC powered on, avoid shaking the aircraft before **{🔴 🔵} (10)** finishes, otherwise it may lead to poor flight attitude

(3) Observe the LED status, wait until the GPS status is normal, then move on to the next step

(4) Flip the CH5 stick to top and bottom quickly for several times, make sure the LED indication corresponds with position of mode setting

Step3. Low-altitude test flight

(1) Pull the left and right stick to the lower right corner in attitude mode, the motor unlocked and starts from No.1 by turn.

(2) After the motors start, apply the throttle to 30% slowly, and then try to push your sticks lightly in Roll, Pitch and Yaw to feel if your multi-rotor moves to the corresponding direction. If ok, all sticks (except throttle stick) return to center, continue to push the throttle until the aircraft takes off.

(3) Feel every channel operation at 2m below, if responding ok, you can explore the best performance by yourself

⚠️ After the flight, we must check whether the temperature of the motor and the reversing motor is the same. If the temperature is inconsistent with each other, the aircraft may have a load imbalance. Therefore, it is need to calibrate the level of propeller,in order to ensure the consistency of the level of propeller.

3 Advanced Functions

3.1 Intelligent Mode

Work Route

In the intelligent mode, the drone reaches the work starting point (home point), go forward automatically by commend. After receiving instruction of changing line, aircraft will automatically to the left or the right fly, then hover, waiting for continuing operation command.
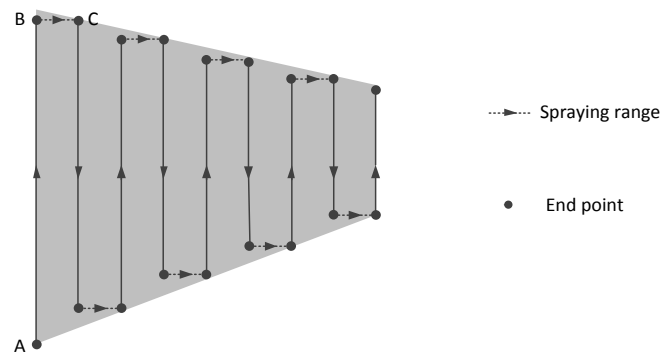
Pls see below work routes:

Figure 3-1 work routes

In the figure, point "A" is starting point when working, aircraft go forward automaticlly by commend on point"B" and receive commend to change the line to the right, at point "C" received backward flight instruction.

The operation mode can not only improve the work efficiency, but also adapt to the irregular working area.

Operation Process

> ⚠ ● When in operation, it is necessary to ensure that the aircraft is visiable.
> ● During operation, the flight mode is required to be switched to work mode.

Step1. Start the aircraft at the start point (Home) and hover over the appropriate height (1~2 m above the crop).

> ⚠ (1) If the aircraft does not record the interruption points during flight, it is need to put the throttle position to 50% position.
> (2) If the aircraft has recorded the interrupted point during fligt, it need to push the throttle lever to 60% position, and then return to the 50% position to take off, the aircraft will fly automatically to the break point to continue operation.

Step2. Push forward roll / pitch lever more than 15% position, the aircraft will automatically achieve highest speed, set the height and fly forward in fixed speed to achieve constant flow spraying.

● During the flight, when the roll / pitch lever is loosened, the aircraft will automatically slow down. When it is hovering, there is no spraying.

● In the course of the flight, you can adjust the flight height by controlling the throttle lever according to the actual situation. When the throttle in the middle, the aircraft will maintain the current height.

Step3. When the aircraft flies to the node, you can turn left / right toggle roll / pitch lever and immediately return middle, the aircraft will carry out the left / right flight cover the distance of one work interval and hover. Work interval namely spraying range and it can be set in assistant software.

Step4. Repeat step 2~ step 3 to complete the process.

3.2 Manual operation

In attitude and GPS mode, users can randomly control aircraft to the areas where need to spray pesticides, turn return channel to the middle position and the spraying will be started. At this moment, the liquid spraying speed is related with the speed of flight.

In GPS mode, when push full bar, the minimum flight speed is 4.5m/s and the maximum speed is the working speed your set before. When the throttle is in middle position, the aircraft can keep the current height; the height can be adjusted by the throttle lever in flight.

3.3 Continue To Spray At The Breakpoint

When encountered the following situation, T1-A will record the breakpoint and can perform the function of continued spraying from the breakpoint. The omission of the operation area can be avoided.

⚠️	● Operation mode, attitude mode and GPS mode can all record the breakpoint; but only in operation mode, GPS mode can be performed to return breakpoints.
	● In fifth channel, you move lever back and forth 4 times to delete the current record breakpoint.
	● If the record of the breakpoint is more than 15 minutes, FC will automatically clear the current record of the breakpoint.

Shortage of Dose
During the flight, T1-A will perform the following operation when the amount of the dose is less than the warning value:

Step1. Aircraft will decelerate and automatically rise to the specified height (in assistant software you can set the height) and hover, then record the current point as breakpoint. In the rising process of aircraft, by switching mode you can stop this rising process, flight controller will still record the breakpoint.

Step2. After rising,users move return switch back and forth one time, the craft will return to start point (home point) at a certain height and along a straight line according to the preset then landing vertically.

Step3. After dosing, start the aircraft. After taking off, the aircraft will automatically rise to return height and flight to the breakpoint, and then reduce to the operating altitude to continue operation. In the process of decline, the user can push the throttle lever to abort the descent process.

| 💡 | Please refer "step 1" of the "working process" for the start of the aircraft. |

Received return command
User actions should be as follows:

Step1. Push return switch back and forth, the aircraft will receive return command.

It will decelerate and automatically rise to the specified height (in assistant software you can set the height) and hover, then record the current point as breakpoint.

Step2. Move return switch back and forth one time, the craft will return to start point (home point) at a certain height and along a straight line according to the preset then landing vertically.

Step3. Re-start the aircraft. It will automatically rise to return height and flight to the breakpoint, and then reduce to the operating altitude to continue operation. In the process of decline, the user can push the throttle lever to abort the descent process.

Low voltage
The following operation will be carried out when the low voltage protection function is started and the first level low voltage protection is triggered:

Step1. The current record will be taken as breakpoint, the aircraft will back to the operation starting point along a straight line according to preset height.

Step2. Start the aircraft after battery charging is finished. After taking off, the aircraft will automatically rise to return height and fly to the breakpoint, and then reduce to the operating altitude to continue operation. In the process of reduced height, the user can push the throttle lever to abort the descent process.

If the aircraft doesn't take low voltage protection, the LED light will flashing under low battery and will not return, nor record the breakpoint.

3.4 One-Key Go Home

You can realize "One-Key Go Home" in any kind of mode when the aircraft is in air and GPS signal is ok.

After the function of "One-Key Go Home" is triggered, the aircraft will maintain current height and heading direction, then fly to overhead point of home point in a straight line, and the LED will turn to

🟢 **(1)** 🟢 **(2)**; After the aircraft arrives at overhead point of home point, it will hover for five seconds, then lands vertically, the speed of landing will be adjusted according to current height of the aircraft; after landing, the flight controller will confirm if the landing is completed, the motors will be locked after confirmation, then the landing is over.

💡	1) When the aircraft is returning to overhead point of home point, you are able to adjust the heading direction of aircraft, but unable to adjust the position of aircraft 2) When the aircraft is landing from overhead point of home point, you can operate channel roll, pitch and yaw.

3.5 Fail Safe And Go Home

If the receiver you are using is SBus, there is no need to set Fail-Safe; if you are using PWM or PPM receiver, you need to set CH5 to Fail-Safe area (you can verify by shutting down the transmitter, refer to "RC setting" for more information)

LED will turn to { 🟡 🔵 } (∞) After the transmitter signal is lost, the aircraft will return to overhead point of home point and land, finally lock (refer to chapter "One-Key Go Home" for more information). If the transmitter signal is resumed, the aircraft will quit "Go Home" mode, then switch to the fight mode CH5 is corresponding with currently.

3.6 Low Voltage Protection

You can set trigger threshold of low-voltage protection in assistant software. This value is measured when the aircraft is loaded, so when the low-voltage protection is trigger, you can find the actual value is higher than trigger value you set after the aircraft landed.

There are two levels of low voltage protection, the first level protection has LED warning(🟡 **(∞)**), during

second level protection the aircraft will land automatically with LED warning(🔴 **(∞)**), then lock after landed.

💡	You can switch to attitude mode to quit protection after automatic landing of low-voltage protection executed.